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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,890	01/22/2004	Robert Conte	011-01	5452

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EXAMINER	
CHANDRAN, BIJU INDIRA	
ART UNIT	PAPER NUMBER
2835	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/762,890	Applicant(s) CONTE, ROBERT	
	Examiner Biju Chandran	Art Unit 2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/13/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 2 recites the limitation "said first layer" and "said second layer" in claim 1. There is insufficient antecedent basis for this limitation in the claim. The examiner has interpreted the first and second layers to mean the top and bottom layers respectively.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 8-11, 15, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Dessiatoun et al. (US Patent 6,898,082 B2).

   - Regarding claim 1, Dessiatoun et al. discloses a heat sink assembly (12) used in power electronics applications (column 8, line 61-62) for transferring heat from a heat generating source to a cooling medium, comprising: a first base plate (16); and a first plurality of thermally

conductive pins (46) located in said first base plate for transferring heat from said heat generating source to said cooling medium, said first plurality of pins extending substantially perpendicular to said first base plate, a first end of each pin of said first plurality of pins being in contact with said heat generating source.

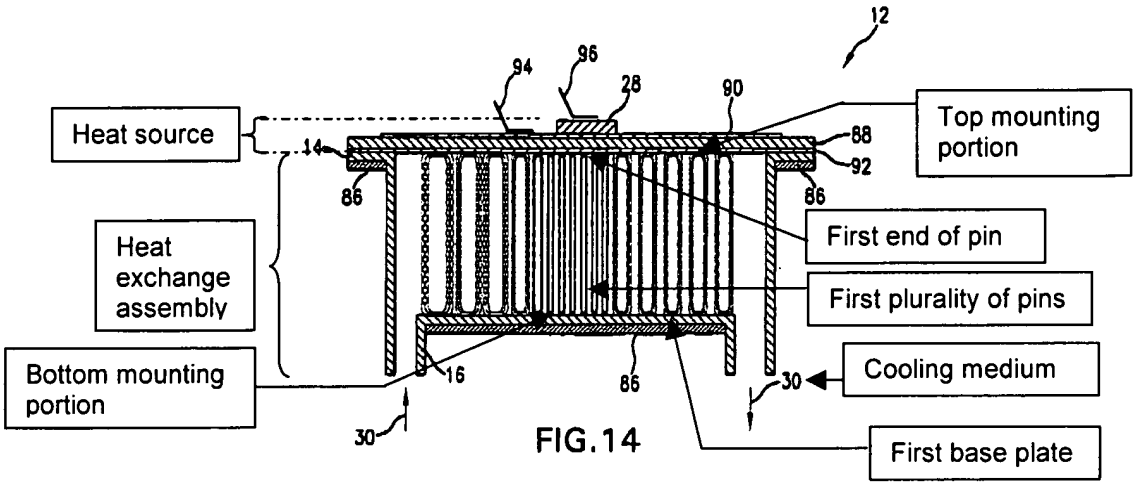


FIG.14

- Regarding claim 2, Dessiatoun et al. further discloses that the heat generating source is comprised of an electronic insulator assembly having a semiconductor die (28) and an insulator (88) that is sandwiched between a top layer (90) and a bottom layer (92), said semiconductor die positioned on the top layer ('first layer' in the claim), the bottom layer ('second layer' in the claim) being in contact with said first plurality of pins.
- Regarding claim 3, Dessiatoun et al. further discloses that the heat generating source is comprised of a semiconductor die (28) being in contact (thermal) with the first plurality of pins (see figure 2).

- Regarding claim 4, Dessiatoun et al. further discloses that the first end of each pin of said first plurality of pins is slightly above a plane of said first base plate in order to contact said heat generating source (marked in figure).
- Regarding claim 8, Dessiatoun et al. further discloses that the first plurality of pins have a geometric shape selected from a square, a triangle, a circle, a diamond, a rectangle, and an ellipse (column 7, lines 25-65).
- Regarding claim 9, Dessiatoun et al. further discloses that the first plurality of pins are arranged in a predetermined layout pattern (column 4, lines 27-35).
- Regarding claim 10, Dessiatoun et al. further discloses that heat sink assembly further comprises a heat exchange assembly (column 9, line 12) having a top mounting portion, a bottom mounting portion, and a coolant channel formed there between, such that said cooling medium for absorbing heat is located in said coolant channel (see figure 2, column 11, lines 2-40).
- Regarding claim 11, Dessiatoun et al. further discloses that the second end of each pin of said first plurality of pins is positioned in said coolant channel for transferring heat from said heat generating source to said cooling medium (see figures 2, 11,13-16, and 18).

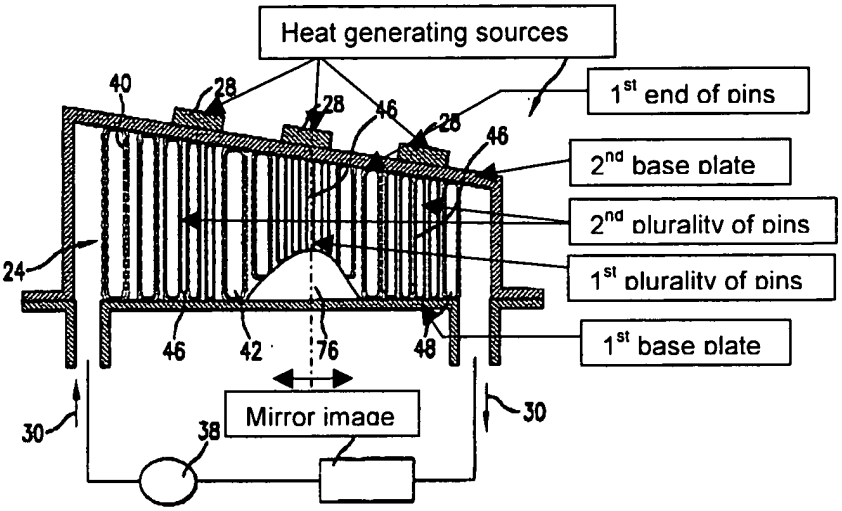


FIG.11

- Regarding claim 15, Dessiatoun et al. further discloses a second base plate and a second plurality of thermally conductive pins located in said second base plate for transferring heat from another heat generating source to said cooling medium, said second plurality of pins extending substantially perpendicular to said second base plate, a first end of each of said second plurality of pins being in contact with said another generating source, said second base plate located substantially parallel and opposite said first base plate, such that said first and second plurality of pins are mirror images of each other being positioned in said coolant channel (marked in figure).
- Regarding claim 16, Dessiatoun et al. further discloses that a pin in the first plurality of pins is offset from corresponding pin in the second plurality of pins (see attached figure), such that a wave type of passage is created for the cooling medium (column 11, lines 5-25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 5, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dessiatoun et al. in view of Samaras et al. (US Patent 6,166,908).

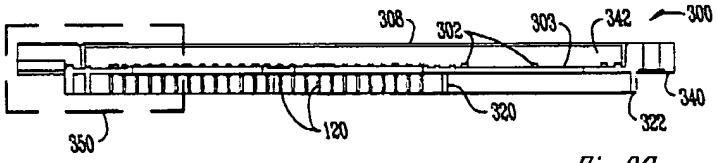


Fig. 3C

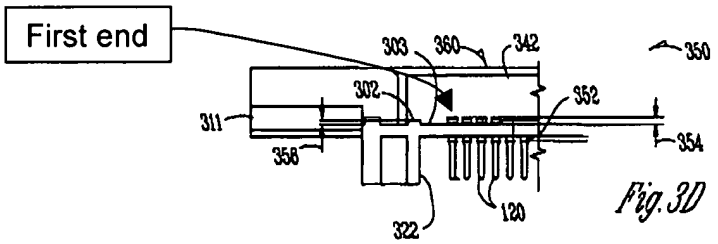


Fig. 3D

- Regarding claim 5, Dessiatoun et al. disclose all the limitations of claim 1. Dessiatoun et al. do not disclose that the first base plate comprises a non-indented and an indented portion. Samaras et al. discloses a semiconductor package and a heat sink assembly with a first base plate (300) comprising a non- indented portion (302) and an indented portion (303) for holding said first plurality of pins, said first end of each pin of said first plurality of pins being slightly above a non-

indented portion of said first base plate in order to contact said heat generating source ('104' in figure 1, column 3, lines 48-49). At the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the indented base plate with the first end of each pin protruding slightly above the non-indented portion of the first base plate, to make sure that the ends of the pins physically contact the heat generating source, so as to reduce the thermal resistance.

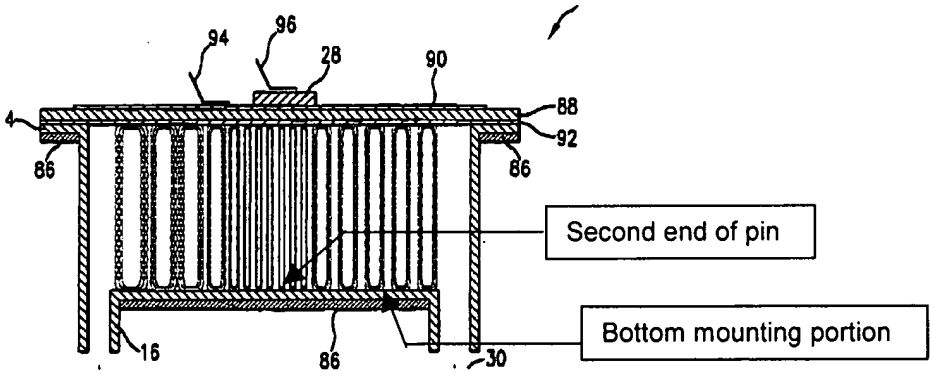
- Regarding claim 7, Dessiatoun et al. satisfies all the limitations of claim 1. Dessiatoun et al. does not explicitly disclose that the heat generating source is attached to the pins by a thermally conductive adhesive. Samaras et al. discloses a first base plate ('102' in figure 1) where the first plurality of pins (120) are attached to the heat generating source (104) by a thermally conductive adhesive ('solder' in column 9, line 16). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to attach the first end of the pins to the heat generating source using a thermally conductive adhesive as taught by Samaras et al., in the heat sink assembly as disclosed by Dessiatoun et al. to enable rework.
- Regarding claim 12, Dessiatoun et al. satisfies all the limitations of claim 11. Dessiatoun et al. does not explicitly disclose mounting hardware for attaching the first base plate to the top mounting portion. Samaras et al. disclose mounting hardware ('152', and the 'fasteners'

described in column 4, line 25) for attaching the first base plate (figure 1, 102) to the top mounting portion (150). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the mounting hardware and scheme taught by Samaras et al. in the heat assembly disclosed by Dessiatoun et al. to open the heat sink assembly in the field and enable easy rework.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dessiatoun et al. in view of Brady et al. (US Patent 5,299,090). Dessiatoun et al. discloses all the limitations of claim 1. Dessiatoun et al. does not explicitly disclose that the pins are attached to the first base plate by an adhesive. Brady et al. disclose a heat sink assembly (11), wherein the first plurality of pins (14) is attached to said first base plate (16) by an adhesive (column 2, lines 41-42). At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the pin to base glue attachment as taught by Brady et al., in the heat sink assembly as taught by Dessiatoun et al., to decrease the cost and time required for the attachment.

5. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dessiatoun et al. in view of Samaras et al. as applied to claim 12, and further in view of Calaman et al. (US Patent 6,367,543 B1).

- Regarding claim 13, Dessiatoun et al. as modified by Samaras et al. satisfies all the limitations of claim 12. Dessiatoun et al. does not disclose a gasket material. Calaman et al. discloses a heat sink assembly with a gasket material (41). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the gasket taught by Calaman et al., in the heat sink assembly disclosed by Dessiatoun et al. to enable a liquid tight seal and to prevent unwanted thermal interactions (column 5, lines 5-10).



- Regarding claim 14, Dessiatoun et al. further discloses that a surface on said second end of each pin of said first plurality of pins, substantially perpendicular to a longitudinal direction of said first plurality of pins, slightly contacts said bottom mounting portion during the expansion of said first plurality of pins due to a heat transfer process (see attached figure).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Biju Chandran whose telephone number is (571) 272-5953. The examiner can normally be reached on 8AM - 5PM. Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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